

## DISCOVERY Planetary **Mission** Operations Concepts

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### ABSTRACT

The NASA Discovery Program of small planetary missions will provide opportunities to continue scientific exploration of the solar system in today's cost-constrained environment. A multidisciplinary team at the Jet Propulsion Laboratory is developing a plan to provide mission operations within the financial parameters established by the Discovery Program. This paper will describe experiences and methods that show promise of allowing the Discovery Missions to operate within the program cost constraints, while maintaining low mission risk, high data quality, and responsive operations.

Planetary mission operations concepts will be surveyed, with an emphasis on low-cost strategies and experiences, used both at the Jet Propulsion Laboratory and at other institutions. The paper will identify the major factors that determine mission operations cost (mission complexity, spacecraft operability, risk policies, and ground operations efficiency); it will then suggest how these factors can be managed to moderate mission operations cost. A taxonomy of mission operations functions will be described and examples of several Discovery-class organizational approaches will be presented. The paper will also describe multi-mission ground system services that will allow Discovery missions to share tracking, data capture, command, and navigation support.

The Discovery Program will encourage the development of "missions with smaller, more focused, spacecraft. We in mission operations must respond with correspondingly small, efficient mission operations concepts and ground data systems.

\*Mr. Coffin will be reporting for the JPL Discovery Operations Concept Team